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AUTHOR Heil, Helen F.
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ABSTRACT

One hundred fifty children in first, second, and third grade participated in a study of the relationships between written language variables in narrative and expository writing and reading comprehension. The seven written language variables investigated included mean length of T-unit and the ratios of various sentence-combining transformations to the total number of T-units. Significant differences were found between grades one and two in most of the language variables, for both narrative and expository writing; no significant differences were found on these variables between grades two and three. Narrative and expository writing differed significantly on all but one measure in grade one and on all measures in grades two and three. Combined, the seven language variables contributed significantly to reading comprehension only in the second grade, although, in grades one and two, most of the individual correlations between reading comprehension and the language variables were significant. (Author/AA)

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The Relationship of Certain Written Language Variables to Measures of Reading Comprehension in the Primary Grades[1]

Helen F. Heil

Uncertainty about the role of language in children's ability to read has pervaded the field of reading for many years. Researchers such as Huey (1908) and Wardhaugh (1971) stated that reading ability is dependent upon the acquisition of considerable linguistic competence. It would certainly seem to follow that a child who has acquired syntactic fluency in the production of language would have a better grasp of the structural relationship of the words in reading than the child who does not have this fluency, and hence, better reading comprehension. A comprehensive search of the literature, however, failed to show a strong correlation between maturity of oral language and progress in reading, especially at the younger grade levels. And although different aspects of young children's language ability have been explored for possible clues to the establishing of a relationship with reading ability, the area of written language has hardly been investigated for possible leads in this direction.

Several developmental studies of written language

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have been undertaken (Harrell, 1957; Hunt, 1965; O'Donnell, Griffin, and Norris, 1967; Ackerman, 1974), but only Ackerman has ventured below the third grade. After many years as a primary teacher, it has been this investigator's experience that primary children, even those in the first and second grades, are capable of expressing themselves adequately on paper if provided with the opportunity, instruction, and guidance. Sandel (1970) demonstrated that is is feasible to obtain written language samples--adequate for analysis--from children in the primary grades. It seemed possible, therefore, to examine, at the younger grade levels, those written language variables found by researchers to be valid indices of syntactic development in the writings of older children and to then explore the relationships between these variables and reading comprehension.

Because the existing research has shown that the syntactic structures employed in written language differ according to the discourse used, both narrative and expository samples were elicited from the subjects in this investigation in order to ascertain if these differences exist at the primary level.

Related Literature

Studies of Language Analysis

Investigations of children's oral and written language have shifted focus considerably through the years. The concept of the unit of measure in the analysis of

language samples has evolved from the sentence to the clause, and to the t-unit, now used almost universally by language analysts.

Although vaguely defined, early investigators (Smith, 1926; Betzner, 1930; Nice, 1933) accepted the sentence as a valid unit of measure for purposes of syntactic analysis, focusing on length and complexity of the sentence and employing grammatical classifications of simple, complex, or compound sentences. The most significant trend found by these investigators was an increase in the use of longer and more complete sentences with increase in age.

McCarthy (1930) attempted to define the sentence more clearly. She and other researchers (Hoppes, 1933; Day, 1933; Davis, 1937; Bear, 1939; Templin, 1957) followed definite rules for the classification of sentences and for determining the occurrence of parts of speech. However, the sentence was criticized as a unit of measure too subject to interpretation. Investigators (Frogner, 1933; Seegars, 1933; LaBrant, 1933; Davis, 1941) looked to the clause as a more practical, objective, easier-to-identify unit of measure than the sentence. Complexity was determined by the amount of subordination employed. LaBrant devised a subordination index for the purpose of measuring linguistic complexity. The index was obtained by dividing the number of dependent clauses by the total number of clauses.

Most of the investigations through the mid-1950s focused on sentence length, length of total responses, and

frequencies of simple, compound, and complex sentences. It appears that syntax as a factor of maturity was neglected except for a growing concern for how the clause was used. Researchers began to feel that measures of maturity should include the way a subject strings words together.

The structuralists' concern for syntax as one of the prime factors in the determination of maturity in language was demonstrated by their definition of language in terms of structure or the patterns formed by the phonological and syntactic units. Strickland (1962) devised a uniform method of investigation which included the study of specific syntactic patterns found in children's language. The unit of measure employed by Strickland in her language analyses was the phonological unit (a unit of speech with a distinct falling intonation). Strickland found the phonological unit unsatisfactory as an index of maturity because of the unlimited number of coordination of main clause which occurred especially in the language of young children.

In conjunction with the phonological unit, Loban (1963) used the communication unit (the smallest unit of language having meaning). Loban's use of both the phonological unit and the communication unit expanded Strickland's procedures and allowed for maximum use of structure and meaning. He found that children in kindergarten to the seventh grade who were rated high in language ability handled syntactic structures with more dexterity than

children rated low in language ability.

Overlapping with the structural linguists' approach, a growing number of researchers from 1961 on used transformational grammar techniques in the analysis of language. This approach was based on N. Chomsky's generative transformational theory of grammar (1957), the rules of which permit the construction of new sentences through the combining and transforming of basic kernel sentences. Two basic tenets of the theory are that the writer has the ability to use a variety of syntactic patterns to express the same idea and that it is possible to describe these syntactic patterns using a generative transformational grammar.

Introduced by Hunt (1965), the minimal terminable unit (t-unit) was defined as a main clause with all the subordinate clauses attached to it. The t-unit is the shortest grammatical unit into which connected discourse can be segmented without leaving any fragments and is considered an objective and practical unit of measure, as well as a valid indicator of maturity in written language. Hunt searched for developmental trends in written language and found that the older student was apparently able to consolidate more grammatical structures into a single grammatical unit, while younger students wrote shorter, separate units.

O'Donnell, Griffin, and Norris expanded Hunt's research by searching for developmental trends in the structures of oral and written language, especially the use of sentence-combining transformations (a transformational process

which produces one sentence where otherwise there would have been two). Their research gave evidence that the number and kinds of sentence-combining transformations used per t-unit are a reliable index of maturity.

Calvert (1971) based some of his language research on the concept of kernel units defined as the underlying structures embedded in surface structures. Using the number of k-units employed per t-unit as an indication of syntactic complexity, he concluded that the k-unit was an index of maturity in language development when studied in combination with other syntactic factors.

The following classifications of transformations, adapted from the research of Bateman and Zidonis (1966) and Mellon (1969), were found useful and practical in the present study of written language: (a) nominal embeddings, defined as transforms occurring only as a result of the use of certain words or groups of words in the replacement of a nominal construction; (b) relative embeddings, defined as transforms occurring only as a result of the use of relative clauses, phrases, or words; (c) t-units which contain no transformations. In this investigation, t-units which contained no transformations were considered kernel structures.

Studies of Different Kinds of Writing

Investigators have not paid particular attention to the different kinds of language produced in different situations; apparently, their major concern has been to

stimulate the child to produce as much language as possible in a given situation. Through the years, numerous procedures for obtaining language samples were used including the recording of spontaneous language, the writing on various topics of choice, and the telling and writing of stories about short films.

Type of discourse seems to have an effect not only on the amount of language produced, but on the amount and kinds of complexity contained in the language. Two investigators who realized this more than forty-five years ago were Frogner (1933) and Seegars (1933). These researchers concluded that different types of discourse produced different kinds of clauses.

A later investigator who also found syntactic differences in different modes of writing was Bortz (1969). Among his findings was the fact that expository writing appears to produce more subordination than does narrative writing.

Studies Relating Reading and Language Development

Although there has been disagreement among researchers as to whether or not a strong positive or specific relationship exists between language development and reading achievement, it is generally agreed that a certain degree of language mastery is necessary for the learning of reading. Just what factors or combination of factors are involved is still the subject of debate.

Although there has been extensive research into the language development of children, comparatively few investigators (Shire, 1945; Calvert, 1971; Wood, 1973; Ackerman, 1974) attempted to isolate specific factors in language which are possibly related to the different aspects of reading achievement. Some major findings of these researchers included:

1. Correlations between complexity of oral language (total number of words used, average length of response, number of elaborated sentences, number of nouns, and number of adjectives) and measures of oral and silent reading were not found to be high enough to make these complexity factors a reliable predictive measure; however, they did indicate trends which demonstrated to some degree that a certain stage of language development corresponds to progress in reading (Shire, 1945).

2. Certain measures of syntactic complexity when considered as a composite (mean t-unit length, subordination, and k-ratio) appeared related to level of reading achievement (Calvert, 1971).

3. Percentage of t-units under nine words, mean number of words per t-unit, and number of sentence-combining transformations per t-unit were among the characteristics found by Wood (1973) to correlate with oral reading ability.

4. Written language complexity as assessed by the number of sentence-combining transformations per t-unit was positively and significantly related to learning to read (Ackerman, 1974).

Purposes of the Study

The major purposes of this study were: (1) to examine selected language variables in the writing of children for developmental trends; (2) to examine the differences, if any, in the syntactic characteristics of two kinds of writing, narrative and expository, of children in grades one through three; and (3) to determine which written language variables, or combinations thereof, appear related to reading comprehension in grades one, two, and three.

Hypotheses

Seven language variables involved in the four general hypotheses generated in this study were:

1. mean length of t-unit;
2. ratio of the number of nominal embedding transformations to the total number of t-units;
3. ratio of the number of relative embedding transformations to the total number of t-units;
4. ratio of the number of nominal and relative embedding transformations to the total number of t-units;
5. ratio of the number of sentence-combining transformations to the total number of t-units;
6. ratio of the number of t-units containing none of the above transformations (k-structures) to the total number of t-units;
7. ratio of clauses to t-unit.

For the first purpose of this study, the following general hypothesis was tested: There are significant differences among the subjects in grades one through three in narrative and expository writing in each of the language variables; those measures at the third grade level are of significantly different frequency than those at the second, and those at the second are of significantly different frequency than the measures at the first grade level.

For the second purpose of this study, the following general hypothesis was tested: There are significant differences between expository and narrative writing in each of the language variables in the first, second, and third grades.

For the third purpose of this study, the following general hypotheses were tested:

1. There is a relationship between level of reading comprehension as measured by the comprehension subtest of the Stanford Achievement Test and the language variables, at each of the grade levels, and for each of the two modes of writing.

2. There is a relationship between reading comprehension as measured by an informal cloze procedure and the language variables, at each of the grade levels, and for each of the two modes of writing.

That is to say, when used as indices of linguistic maturity, the seven language variables explain a significant amount of variance in the reading comprehension scores.

Collection of Data

The subjects of the study were drawn from the first, second, and third grades of the Homestead School in Garden City, New York. The Garden City School District is a suburban, upper middle-class, all white district consisting of two K-3 schools, one K-2 school, two K-6 schools, one junior high school, and one senior high school.

The children in the Homestead School number 188 students. There are sixty-three in the first grade, fifty-five in the second grade, and seventy in the third grade. For this investigation, fifty students were selected from each grade level.

The Stanford Achievement Test, Form B, Comprehension subtest, was administered as one measure of reading comprehension. Cloze tests were used as the second measure.

The data were collected during the spring of 1975 in the first, second, and third grades of the Homestead School in Garden City, New York. The testing and sampling procedure followed a set schedule.

Written language samples of two kinds were obtained, exposition and narration. The samples in the expository mode were acquired using as stimuli (1) a game experienced by all of the children in their gym classes which they were asked to explain in writing; and (2) the assembling of an aquarium in science class which the children were also asked to explain in writing. Two open-ended color films were used

as stimuli to obtain the narrative samples. The films contained no talking, the only sound being a musical background. The children were requested to give an account of the story as shown and to supply the ending they thought appropriate. In all, four samples of writing were obtained from each child at each grade level.

Analysis of each sample included counting the total number of words in the sample and segmenting the language into t-units which were then subjected to a detailed syntactic analysis based on principles of transformational grammar. Sentence-combining transformations were classified as follows: nominal embeddings, which included noun clauses and noun phrases; relative embeddings, which included relative clauses, phrases, and words; nonclausal adverbial constructions; and intra-t-unit coordinations.

Thus, a total of six hundred samples were subjected to detailed syntactic analysis. There were 3,145 narrative t-units and 2,006 expository t-units for a total of 5,151 t-units in all.

Treatment of the Data

The hypotheses involving the differences among grade levels in the measures of written language were tested with one-way analysis of variance tests. For the two modes of writing and the seven language variables, fourteen one-way analysis of variance tests were performed. Follow-up procedures were used to test the hypothesized differences by

grade level.

The hypothesis involving the possible differences between expository writing and narrative writing when measured with the seven language variables were examined with t-tests. Seven correlated t-tests were compuced for each grade level, with a total of twenty-one tests altogether.

The hypotheses involving the possible relationships between the written language variables and the two measures of reading comprehension were tested with a multiple step-wise regression for each grade level, for each type of writing sample, for a total of twelve equations.

Given that the equations explain a significant proportion of the criteria scores, the patterns of the unique contribution of each variable at each grade level were examined.

Major Findings

Written Language Analysis

When the data from the ANOVAS were reviewed, a general pattern seemed to emerge. Significant differences were found between grades one and two in most of the language variables for both narrative and expository writing, while no significant differences were found between grades two and three.

Insert Tables 1 and 2 about here

Observed deviations from this general pattern were as follows:

1. A slightly different grade differentiation was found for narrative nominal embeddings in that significant differences were found between grades one and three instead of between grades one and a combination of grades two and three, as for the other variables.

2. No significant differences among grade levels were found for expository nominal embeddings.

3. No significant differences among grade levels were found in narrative relative embeddings.

When the frequencies of the individual grammatical constructions within the language variables were examined, it was found that the subjects used several of them much more than others. A summary of these constructions follows:

1. The nominal embedding used with most frequency in all grades and in both modes was the noun clause used as object.

2. No single relative embedding was most frequently utilized by the subjects. The frequency varied, depending on grade and mode.

3. The nonclausal adverbial construction used with most frequency in all grades and in both modes was the adverbial prepositional phrase (of the sentence-combining type) and the adverbial infinitive.

4. The intra-t-unit coordinations used with the most frequency in all grades and in both modes were coordinated nominals and coordinated predicates.

Insert Tables 3 and 4 about here

Comparison of the Two Modes of Writing

In grade one, narrative writing was found to be significantly different from expository writing in all but one of the seven language measures (use of nominal embeddings).

In grades two and three, narrative writing was found to be significantly different from expository writing in all seven language measures.

Insert Table 5 about here

Relationships Between Written Language and Reading-Single Language Variables

Grade one. In narrative writing, significant correlations were found between the standardized test and sentence-combining transformations, the k-structure, and mean length of t-unit. Significant correlations were found between measures on the cloze and sentence-combining transformations and the k-structure. In expository writing, significant correlations were found between the standardized test and mean length of t-unit, ratio of clause to t-unit, the k-structure, nominal and relative embeddings, and relative embeddings alone. For the measures on the cloze, there were significant correlations for the k-structure, relative embeddings, ratio of clause to t-unit, and nominal and relative embeddings.

Grade two. In narrative writing, significant correlations

were found between the standardized test and all but one of the seven language variables. The only variable which revealed no significant correlation with the standardized test was nominal embeddings. For the measures on the cloze, there were significant correlations for nominal and relative embeddings, relative embeddings, sentence-combining transformations, mean length of t-unit, ratio of clause to t-unit, and the k-structure.

In expository writing, significant correlations were found between the standardized test and relative embeddings, nominal and relative embeddings, sentence-combining transformations, the k-structure, and mean length of t-unit. For the measures on the cloze, significant correlations were found for nominal and relative embeddings, the k-structure, sentence-combining transformations, relative embeddings, and nominal embeddings.

Grade three. In narrative writing, no significant correlations were found between the standardized test and any of the language variables. For the cloze test, significant correlations were found for sentence-combining transformations, nominal and relative embeddings, and the k-structure.

Insert Table 6 about here

Relationships Between Written Language and Reading-Combined Language Variables

Grade one. In narrative and expository writing, the combined

seven language variables did not contribute significantly to the variance of comprehension as measured by either the standardized test or the cloze procedure. The narrative k-structure maintained significance through the last step of the equation, explaining 16 percent of the variance of comprehension as measured by the standardized test.

Insert Table 7 about here

Grade two. In narrative and expository writing, the combined seven language variables contributed significantly to the variance of comprehension as measured by the standardized test. The combined narrative written language variables explained 41 percent of the variance and the combined expository written language variables explained 44 percent of the variance. Narrative nominal embeddings maintained significance at the last step of the equation, while each of two combined expository variables (relative embeddings and ratio of clause to t-unit) maintained significance at the last step of the equation.

In narrative writing, the combined seven language variables contributed significantly to the variance of comprehension as measured by the cloze. Narrative nominal embeddings maintained significance at the last step of the equation.

Insert Table 8 about here

In expository writing, no combinations of the seven language variables produced significant contributions to the variance of comprehension as measured by the cloze.

Grade three. No combination of the seven language variables produced significant contributions to the variance of comprehension as measured by the cloze or the standardized test, in either mode.

Insert Table 9 about here

Major Conclusions

Written Language Analysis

The findings of this investigation appear to support the conclusion that it is feasible to examine the writing of primary children using techniques based on transformational grammar found to be successful in the research of older children's writing. With very few exceptions, all of the constructions were employed by the subjects in all three grades investigated. Primary children seemed capable of using most of the constructions found in the repertoire of writing of intermediate and high school children.

In general, all of the patterns which emerged from the investigation of the variables indicated that at the primary level, significant growth in the use of the syntactic structures occurred between the first and the second grade, with no significant growth occurring between the second and

the third grade. Apparently, there is a period of rapid development in written language which starts soon after the child begins instruction in the first grade which then planes out somewhere between the second and the third grades.

1. Mean length of t-unit.

The findings of this study support the conclusions of Hunt (1965) and O'Donnell, Griffin, and Norris (1967) that mean length of t-unit is a valid indicator of maturity in children's written language. T-unit length increased significantly from grade one to grades two and three. This significant increase coincided exactly with findings of rapid development in almost all of the syntactic structures under investigation. Thus, a factor in the lengthening of t-units appears to be the ability to manipulate sentence-combining transformations.

2. Sentence-combining transformations.

The number of sentence-combining transformations employed per t-unit increased significantly from grade one to grades two and three supporting the conclusions of Hunt (1965), O'Donnell, Griffin, and Norris (1967), and Ackerman (1974) that the use of sentence-combining transformations is a valid index of maturity in written language. Apparently, children easily grasp the techniques of manipulating certain grammatical structures within sentence-combining transformations as early as the first grade, with rapid growth to the second grade. At this point in their development, children seem to level off, perhaps indicating

a period of further assimilation and application of learned skills without significant expansion.

Many of the trends in growth observed in the individual constructions within the sentence-combining transformations of the primary children of this investigation related to the findings of O'Donnell, Griffin, and Norris (1967) and Hunt (1965) at the intermediate and high school levels. For example, the primary children of this investigation did not, or were not able to use the noun clause as subject, supporting Hunt (1965) in his conclusion that such use is probably a mark of maturity.

3. Ratio of clause to t-unit.

The increment from the first grade to the second grade in ratio of clause to t-unit was significant, dovetailing with the ratios obtained by Hunt (1965). This appears to further substantiate his theory that a contributing factor in the development of children's writing is the use of the subordinate clause.

4. The k-structure.

From the findings on the k-structure, it was possible to conclude that the use of k-structures in proportion to the total t-units produced appears to be a sensitive measure of development toward maturity in children's written language production. The ratio is relatively simple to compute.

Comparisons of the Two Modes of Writing

The literature has shown that type of discourse

appears to have an effect not only on the amount of language produced, but on the amount and kinds of complexity contained in the language. The findings of the present investigation indicated significant differences in all grades between narrative and expository writing with respect to all of the variables investigated, except one, in the first grade, (nominal embeddings). The subjects of the present study produced the most sentence-combining transformations and the most subordination when they wrote in the expository mode.

A review of the data concerning the use of the k-structure further clarified the trends manifested by the children's use of sentence-combining transformations. If one can assume that the fewer the k-structures employed, the more complex the written language, expository expression, then, is apparently more conducive to the writing of more complex structures. At least for the primary levels, as students advance in grade and become more adept at manipulating sentence-combining transformations, they appear to do this more when they write exposition than when they write narration.

Mean length of t-unit was found to be significantly different in the two modes. The subjects wrote significantly longer t-units in exposition than they did in narration. The significantly greater number of clauses and other sentence-combining transformations employed per t-unit appeared to be contributory factors in the lengthening of t-units. The findings of a greater number of complex structures per

t-unit in expository writing further supported the concept which emerged from the present research--that the expository mode appears to lend itself to the writing of those structures generally considered by researchers to be a mark of control in written language, namely, sentence-combining transformations.

Further examination of the t-units revealed another interesting difference between the modes. Although the subjects wrote significantly longer t-units in exposition, they wrote notably fewer t-units; and conversely, narration produced significantly more t-units, but notably shorter t-units. It would seem that, at least for the expository writing tasks of this investigation, the subjects had less to say than for the narrative tasks; but what was said, was said in a more complex manner. Evidently, the written explanation of a process calls for language that contains more complex structures than does the telling of a story.

The findings of the present study indicate that young children write differently when they write for different purposes, supporting the conclusions of Frogner (1933), Seegars (1933), and Bortz (1969).

Relationships Between Written Language and Reading

The results of the present investigation indicated that reading comprehension as measured by the comprehension subtest of the Stanford Achievement Test and an informal cloze procedure appears to be related to the complexity

attained in written language production when such complexity is based on the use of sentence-combining transformations. Sentence-combining transformations, generally considered by researchers to be factors of maturity in writing, were exactly those factors found significantly related to reading comprehension. This was further substantiated by the data concerning the use of the k-structure, or those t-units not containing any transformations. The k-structure was the factor which exhibited the strongest relationships with reading comprehension.

In general, significant growth occurred only from grade one to the end of grade two. It was in the second grade where very substantial relationships were observed between the individual language variables and reading comprehension, and it was in the second grade where substantial relationships were observed when all of the language variables were considered together.

The coincidence of significant correlations with reading comprehension in the period of greatest expansion in the use of these language structures appears to demonstrate the strong relationship between the fast developing skills of writing, and reading at this particular period. From the findings of the present investigation, it was possible to conclude that at least for this period in the child's school career, maturity in writing appears to be strongly related to reading comprehension.

Implications for Teaching and Curriculum Planning

The methods of analyses employed in this study led to the observation that at least for the subjects involved, in the first and second grades there appeared to be a period of rapid and extensive development in the use of certain syntactic structures, especially between the first grade and the end of the second grade.

Very commonly, teachers consider the second grade, in a sense, an extension of the first grade. The results of this investigation revealed that, at least for syntactic writing skills, the period from the first grade to the end of the second grade appeared to be an advantageous time for the teaching of these skills. Much information concerning types of grammatical constructions and the fluency of their use by primary subjects has been provided by the present investigation. The fact that even at the earliest level most of the constructions possible did occur suggests that they are probably within the potential capacity of primary school children.

A more efficient program of writing based on teaching materials and techniques designed to heighten awareness of the structural resources of the language might be particularly effective in these early years of formal schooling. Curriculum designers might give some thought to a program of sentence-combining to help children grow in this awareness. The findings of the present study seem to permit the conclusion that children of this age are indeed

able to acquire and manipulate the grammatical structures within sentence-combining transformations. A program which stresses and provides models of writing featuring such transformations might be one effective way to aid children in acquiring an awareness of the structures of language.

Writing in a mode other than narration is not usually considered within the capabilities of the younger primary child. The findings of the present study suggest that exposition seems to offer more opportunity to use more complex structures than narration, and that primary youngsters, even the younger ones, are capable of writing in this mode, if given the opportunity. Since the knowledge of more complex structures appears to be related to facility in reading comprehension, it would seem an opportune time to include experiences in writing exposition even at the first and second grade level. In addition to tasks that mostly require the child to tell what happened, or tell the story of, etc., tasks that induce the young student to expound or explain might also be included in the program of instruction.

Suggestions for Future Research

1. A thorough review of the literature in the area of written language research revealed several extensive investigations; however, comparisons and references are difficult due to variation in approaches to the problems of language research. Consequently, it is difficult to draw conclusions and inferences when viewing the present research

in the perspective of past investigations. The following are brief descriptions of some of the problems with possible alternatives:

a. Because of the varying methods used to elicit written language samples, it was difficult to make comparisons of findings. Stimuli used in the past to elicit written language samples have ranged from pictures, slides, and various types of films, to the assignment of a wide variety of writing tasks. Researchers might study the problem of appropriate writing stimuli and determine which elicit a protocol most representative of the repertoire of children's written language. Perhaps a cooperative research project might be undertaken which involves grades one through twelve, using stimuli and task conditions that are as uniform as possible.

b. The type of writing sample obtained in past investigations of children's written language development has usually been of a narrative nature. The findings of Frogner (1933), Seegars (1933), Bortz (1969), and the present researcher indicated that writing in different discourse produces different syntactic structures. It seems worthwhile for investigators to consider eliciting more than one type of discourse when attempting to obtain a representative sample of a child's syntactic repertoire. In the case of primary children, it seems feasible to elicit at least two or three samples each of narrative and expository writing per subject. Eliciting longer samples does not appear as

important as obtaining several, in different discourse.

c. There appears to be an urgent need for some accord as to effective techniques of analysis and the variables to be examined. There is a need for clarity in the identification of grammatical structures, and some agreement concerning the labeling of these structures. This is especially true of the linguistic analyses using transformational grammar as a basis. In the course of the preparation of the present study, it became apparent that the choice of variables was not an easy matter. A review of the literature revealed, for instance, that the structuring of embedding categories differed from study to study. Also, certain kinds of sentence-combining transformations were not recognized as such by some investigators, as for example, particular adverbial prepositional phrases. Investigators of written language, including the present one, differed in their choice of transformations to be examined. Research becomes more meaningful if researchers have a consensus as to the particular grammatical structures included in studies of written language, and the classification of these structures. A better understanding of the nature and implications of transformational grammar may lead to a refinement of analysis techniques and procedures.

2. Since one of the delimitations of this investigation was the fact that results were generalizable only to similar writings obtained with similar stimuli and under similar conditions, it would appear valuable to conduct more

research of the present kind. A cooperative research project might be undertaken in different parts of the country so that varied populations and school situations might be examined. In this way it may be learned if differences in written language production are related to the following variables: (a) intelligence, (b) socio-economic status, (c) teacher personality, (d) classroom atmosphere, and (e) instructional program.

3. In the present cross-sectional investigation, one could only speculate about the development of fluency in the same group of children during what appeared to be a period of intense development of the writing skills. It would appear valuable to undertake similar research, but longitudinal in design, involving written language samples produced by the same children through the grades.

4. The design of the present investigation allowed for statistical analysis of seven language variables. These variables, however, were comprised of syntactic structures for which only the frequencies could be examined for observable trends. Since there were several individual structures prominently used by the primary children in this investigation, these might be tested for significant differences among grades. Among such grammatical structures in the present research were: the noun clause used as subject, infinitive phrase used as object, noun + genitive, noun + adjective, and adverbial clauses of time and condition.

5. The differences between the complexity of

narrative and expository writing in primary children have been demonstrated by the results of the present investigation. For example, given that mean length of t-unit is universally considered a fairly sensitive measure of maturity in written language, the reasons for the present third grade expository mean length of t-unit being comparable to Hunt's eighth grade narrative mean length might be explored.

6. Books designed for the teaching of reading in the primary grades might be subjected to the method of analysis used in this study in order to help determine appropriateness for the student.

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Table 1

Scheffé Contrast of Homogeneous Subtests of Seven Language Variables in Narrative Writing

1. Mean Length of t-unit

Subset 1			
Group	I		
Mean	7.03		
Subset 2			
Group	III	II	
Mean	8.54	8.69	

2. Nominal Embeddings

Subset 1			
Group	I	II	
Mean	4.96	7.77	
Subset 2			
Group	II	III	
Mean	7.77	9.24	

3. Relative Embeddings

Subset 1			
Group	III	II	I
Mean	3.12	3.18	4.65

4. Nominal and Relative Embeddings

Subset 1			
Group	III	II	
Mean	2.30	2.35	
Subset 2			
Group	I		
Mean	3.88		

5. Sentence-Combining Transformations

Subset 1			
Group	III	II	
Mean	1.33	1.45	
Subset 2			
Group	I		
Mean	3.04		

6. Relative Embeddings

Subset 1			
Group	III	II	
Mean	0.40	0.48	
Subset 2			
Group	I		
Mean	0.65		

7. Ratio of Clause to t-unit

Subset 1			
Group	I		
Mean	1.11		
Subset 2			
Group	II	III	
Mean	1.20	1.21	

Table 2

Scheffé Contrast of Homogeneous Subtests of Seven Language Variables in Expository Writing

1. Mean Length of t-unit

Subset 1			
Group	I		
Mean	7.85		
Subset 2			
Group	II	III	
Mean	10.65	11.13	

2. Nominal Embeddings

Subset 1			
Group	I	II	III
Mean	4.19	5.54	6.14

3. Relative Embeddings

Subset 1		
Group	III	II
Mean	1.49	1.62
Subset 2		
Group	I	
Mean	3.02	

4. Nominal and Relative Embeddings

Subset 1		
Group	III	II
Mean	1.18	1.36
Subset 2		
Group	I	
Mean	2.86	

5. Sentence-Combining Transformations

Subset 1		
Group	III	II
Mean	0.76	0.93
Subset 2		
Group	I	
Mean	2.00	

6. Percentage of t-units Containing No Transformations (k-structures)

Subset 1		
Group	III	II
Mean	0.22	0.26
Subset 2		
Group	I	
Mean	0.50	

7. Ratio of Clause to t-unit

Subset 1		
Group	I	
Mean	1.26	
Subset 2		
Group	III	II
Mean	1.45	1.46

Table 3

Observed Frequency Distributions of Nonclausal Adverbial Constructions (of the Sentence-Combining Type) for the Narrative and Expository Samples for Grades One, Two, and Three

Grade		Adverbial Prepositional Phrase	Proportional Use*	Adverbial Participial Phrase	Adverbial Infinitive	Proportional Use*	Other	Total t-units
	Embedding	25A		26	27		28	
	Narrative	19	3%	1	14	1%	0	734
I	Expository	5	1%	0	12	3%	0	437
	Total	24		1	26			1,171
	Narrative	42	5%	5	33	4%	0	933
II	Expository	4	1%	6	51	7%	2	685
	Total	46		11	84			1,618
	Narrative	55	4%	5	83	6%	0	1,478
III	Expository	14	2%	1	83	9%	1	884
	Total	69		6	166			2,362
	Narrative	116	4%	11	130	4%	0	3,145
I, II, III	Expository	23	1%	7	146	7%	3	2,006
	Total	139		18	276			5,151

*Proportional use of constructions to t-units.

Table 4

Observed Frequency Distributions of Intra-t-unit Coordinations for the Narrative and Expository Samples for Grades One, Two, and Three

Grade		Adjective Modifiers	Adverbial Modifiers	Nominals	Proportional Use*	Predicates	Proportional Use*	Total t-units
	Embedding	29	30	31		32		
	Narrative	1	1	11	1%	52	7%	734
I	Expository	0	0	59	14%	36	8%	437
	Total	1	1	70		88		1,171
	Narrative	0	2	14	2%	178	19%	933
II	Expository	8	5	160	23%	67	10%	685
	Total	8	7	174		245		1,618
	Narrative	0	0	46	3%	260	18%	1,478
III	Expository	8	16	139	16%	108	12%	884
	Total	8	16	185		368		2,362
	Narrative	1	3	71	2%	490	16%	3,145
I, II, III	Expository	16	21	358	18%	211	11%	2,006
	Total	17	24	429		701		5,151

*Proportional use of constructions to t-units.

Table 5

Correlated t-tests for Narrative and Expository Writing in Grade III

Variable	Number of Cases	Mode	Mean	SD	Corr.*	T Value	2-Tail Prob.**
1. Mean Length of t-unit	50	Narr. Exp.	8.54 11.13	1.31 3.55	0.18	-5.16	0.000
2. Nominal Embeddings	50	Narr. Exp.	9.24 6.14	7.15 5.09	0.13	2.67	0.010
3. Relative Embeddings	50	Narr. Exp.	3.12 1.49	3.85 1.44	0.01	2.82	0.007
4. Nominal and Relative Embeddings	50	Narr. Exp.	2.30 1.18	1.91 1.01	0.06	3.76	0.000
5. Sentence-Combining Transformations	50	Narr. Exp.	1.33 0.76	0.98 0.56	0.11	3.76	0.000
6. Percentage of t-units Containing No Transformations (k-structures)	50	Narr. Exp.	0.40 0.22	0.15 0.15	0.27	6.76	0.000
7. Ratio of Clause to t-unit	50	Narr. Exp.	1.21 1.45	0.15 0.24	0.24	-6.64	0.000

*$r \geq .262$
**$p \leq .05$

Table 6

Pearson Product Moment Correlation Coefficients--Seven Language Variables With Stanford Achievement Test and Cloze Procedure-- Narrative and Expository Modes

	Grade I n=50		Grade II n=50		Grade III n=50	
			Grade I--III			
Variable	SAT	Cloze	SAT	Cloze	SAT	Cloze
	Narrative					
1. Mean Length t-unit	.267	.249	.349	.178	.160	.355
2. Nominal Emb.	-.121	-.059	.204	.292	.161	.077
3. Relative Emb.	-.064	-.074	-.481	-.298	-.058	-.051
4. Nom. and Rel. Emb.	-.189	-.260	-.498	-.327	-.132	-.143
5. SCT	-.318	-.359	-.447	-.320	-.175	-.212
6. k-structure	-.406	-.387	-.297	-.325	-.103	-.177
7. Clause to t-unit	.127	.256	.342	.120	.089	.213
	Expository					
1. Mean Length t-unit	.428	.240	.334	.190	.021	.010
2. Nominal Emb.	-.094	-.064	.219	.127	.111	.188
3. Relative Emb.	-.268	-.316	-.498	-.370	-.133	-.203
4. Nom. and Rel. Emb.	-.311	-.305	-.451	-.384	-.159	-.269
5. SCT	-.254	-.217	-.395	-.342	-.200	-.272
6. k-structure	-.409	-.391	-.386	-.326	-.148	-.264
7. Clause to t-unit	.452	.314	.056	.143	-.067	.112

*$r \geq .262$

Table 7

Multiple Regressions-ANOVAS at Last Step of Equation
Seven Language Variables with Two Measures of
Comprehension, Narrative and Expository Writing
Grade I n=50

Analysis of Variance	DF	SS	MS	F	
SAT-Narrative*					
Regression	7	1641.403	234.486	1.742	$p \geq 2.25$
Residual	40	5382.076	134.551		
Cloze-Narrative					
Regression	5	1821.133	364.226	2.080	$p \geq 2.44$
Residual	42	7352.533	175.060		
SAT-Expository					
Regression	8	2067.103	258.387	2.033	$p \geq 2.18$
Residual	39	4956.375	127.086		
Cloze-Expository					
Regression	7	1955.952	279.421	1.548	$p \geq 2.25$
Residual	40	7217.714	180.442		

Significant Variable
*k-structure (variance explained-16%) F=4.807; $p \geq 4.08$

Table 8

Multiple Regressions-ANOVAS at Last Step of Equation
Seven Language Variables with Two Measures of
Comprehension, Narrative and Expository Writing
Grade II n=50

Analysis of Variance	DF	SS	MS	F	
SAT-Narrative*					
Regression	7	5764.208	823.458	4.241	$p \geq 2.24$
Residual	42	8153.311	194.126	Variance explained-41%	
Cloze-Narrative**					
Regression	7	2945.118	420.731	2.320	$p \geq 2.24$
Residual	42	7615.061	181.311	Variance explained-28%	
SAT-Expository***					
Regression	7	6124.902	874.986	4.715	$p \geq 2.24$
Residual	42	7792.617	185.538	Variance explained-44%	
Cloze-Expository					
Regression	7	2371.073	338.724	1.737	$p \geq 2.24$
Residual	42	8189.106	194.978		

Significant Variables
*Nominal Embeddings: $F=5.202$; $p \geq 4.07$
**Nominal Embeddings: $F=6.029$; $p \geq 4.07$
***Relative Embeddings: $F=10.860$; $p \geq 4.07$
Ratio of Clause to t-unit: $F=10.849$; $p \geq 4.07$

Table 9

Multiple Regressions-ANOVAS at Last Step of Equation
Seven Language Variables with Two Measures of
Comprehension, Narrative and Expository Writing
Grade III n=50

Analysis of Variance	DF	SS	MS	F	
SAT-Narrative					
Regression	7	508.401	72.628	0.389	$p \geq 2.24$
Residual	42	7840.818	186.686		
Cloze-Narrative					
Regression	6	2793.910	465.651	1.134	$p \geq 2.32$
Residual	43	17655.469	410.592		
SAT-Expository					
Regression	8	912.543	114.067	0.628	$p \geq 2.18$
Residual	41	7436.676	181.382		
Cloze-Expository					
Regression	8	3087.175	385.896	0.911	$p \geq 2.18$
Residual	41	17362.204	423.468		